



100 YEARS OF SUPERIOR SERVICE

Artesian Water Company, Inc. ▲ Artesian Wastewater Management, Inc. ▲ Artesian Utility Development, Inc.

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June 29, 2006

Mr. Bruce Burcat
Delaware Public Service Commission
861 Siver Lake Blvd.
Cannon Building, Suite 100
Dover, DE 19904

RE: Certification of Self-Sufficiency of Water Supply

Dear Mr. Burcat:

Enclosed are one original and ten (10) copies of Artesian Water Company's Certification of Self-Sufficiency of water supply in accordance with 26 Del.C., Chapter 14.

If you have any questions on this matter, please do not hesitate to call.

Sincerely,

Bruce P. Kraeuter, P.E.
Vice President of Planning and Engineering

BPK/jac

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE**

IN THE MATTER OF ARTESIAN WATER)
COMPANY'S PETITION FOR RECOGNITION)
OF WATER SUPPLY SELF-SUFFICIENCY)

**Artesian Water Company, Inc.
664 Churchmans Road
Newark, DE 19702**

June 29, 2006

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I. INTRODUCTION

On August 4, 2003, Governor Minner signed into law H.B. 118, the "Water Supply Self-Sufficiency Act of 2003" (the Act). The purpose of the Act is to ensure that water utilities in northern New Castle County "have adequate supplies of water available, even during times of drought, to meet the present and future needs of this State on a continuing and sustainable basis." (26 Del.C., Section 1401(1)) To accomplish this policy, a number of specific requirements are imposed upon both the jurisdictional (those utilities subject to Public Service Commission (PSC) oversight) and non-jurisdictional (those utilities exempt from PSC oversight) utilities in northern New Castle County.

For each jurisdictional water utility in northern New Castle County, on or before July 1, 2006 (and every third year thereafter), the utility shall file with the Public Service Commission the following:

1. a consumer water conservation plan for the following three-year period; and
2. a certification of adequate supply for the following three-year period. (26 Del.C., Section 1404(a)).

The consumer water conservation plan (Plan) must include:

1. a description of the utility's proposed methods of consumer education to:
 - a. make consumers aware of the benefits arising from the efficient use of water supply;
 - b. make consumers aware of, and understand, any water conservation rate in effect, or that will be implemented by the utility during the following three years;
 - c. make consumers aware of the existence of both new and retrofitted consumer equipment that improves the efficient use of water; and
 - d. make consumers aware of the costs arising from the loss of water through leakage in consumer water systems; and

2. for all subsequent reports, an evaluation of the effectiveness of the utility's plan in informing consumers of methods to improve efficient use of the water supply. (26 Del.C., Section 1404(b))

The utility must also file with the PSC a certification that the utility "has sufficient sources of water to provide adequate supply to meet the projected demand in the drought sensitive area (northern New Castle County) for the ensuing three years." With the certification, the utility must also submit supporting materials and documents identifying each source of supply and the volume of water available from each source. The supporting materials must demonstrate that the volume of supply will be adequate to meet or exceed the projected demand. (26 Del.C., Section 1404(d))

Beginning with the 2009 reporting year, each jurisdictional water utility must also certify that its sources of supply to meet a drought of record are not reliant upon out-of-state suppliers, except for minimum purchase obligations under purchase water contracts in existence on April 1, 2003. (26 Del.C., Section 1404(e))

This narrative and accompanying exhibits are intended to fulfill the requirements of the Act. The narrative is intended first to provide a basic understanding of Artesian Water Company's consumer water conservation program. The narrative then proceeds to delineate Artesian's sources of supply and current and projected water demand that might be realized during a 75-day drought of record as defined by the Act. (26 Del.C., Section 1402(3)) This delineation demonstrates Artesian's self-sufficiency of supply under these most extreme climatic conditions. Finally, Artesian certifies its ability to meet its customers' water needs during a recurrence of a drought of record in northern New Castle County.

II. ARTESIAN'S CONSUMER WATER CONSERVATION PLAN

Artesian strongly believes in the importance of the wise use of water and was the first water utility in Delaware to undertake an extensive water conservation program. As a result of our efforts, we have experienced a 13.8 percent decrease in our average demand on a per customer basis over the past decade.

In 1992, Artesian Water Company, Inc. initiated an aggressive three-point conservation plan to encourage customers to take more responsibility for their water usage. First, the Company put into effect an inclining block rate structure that charged customers who used under 5,000 gallons/quarter the lowest rate, a slightly higher rate for customers who consumed between 5,000 and 20,000 gallons/quarter, and the highest rate for customers who used over 20,000 gallons/quarter. In effect, customers who wanted to use more water could choose to do so, but at a higher rate.

Second, the Company offered water-saving devices such as showerheads and faucet aerators to customers at cost to help reduce consumption. In the twelve years since this program began, water-saving devices have become more readily available at stores such as Lowes and Home Depot, at lower cost, and so the Company has phased out of this service.

The third phase of this program consists of educating our customers to conserve water and help protect our water resources. From the beginning, Artesian has included conservation hints in its customer newsletter, *The Artesian Pipeline*. Additionally, we provided a booklet entitled "25 Things You Can Do to Prevent Water Waste" to all of our new customers. Strategically placed advertisements in publications that reach our customers also provide water-saving suggestions.

The Company takes its conservation message to community events such as the Delaware Nature Society's Harvest Moon Festival and, upon request, speaks at community get-togethers such as the Sears Retiree Club. In the summertime, Artesian takes its MistTree™ to events such as Rockwood's Ice Cream Festival, to cool off attendees as well as to remind them to save water. In May, the Company celebrates "Water Week," usually with a lobby display of conservation ideas or devices that are available to visitors. This year, in addition to a lobby display, we distributed posters and

brochures to all New Castle County libraries. We also work with organizations such as the Delaware Center for Horticulture, the Delaware Nature Society and the Institute for Public Administration, Water Resources Agency, University of Delaware, to promote the use of drought-tolerant plants, rain barrels and efficient water usage for gardens. In addition, the landscaping in front of the Company's main office is a Certified Backyard Habitat, designed to provide food, water, home and recreation for wildlife. It serves as an example of an alternative landscaping idea that also uses water conservatively.

For the last several years, we have included a list of suggestions for water conservation on our web site. The Company also has a school program, created in cooperation with the Delaware Department of Natural Resources and Environmental Control, for fourth graders. The goal is to instill in young people the desire to form good water-using habits when they are old enough to understand the importance of water conservation but young enough to change, or avoid developing, any bad water-using habits. We have reached over 8,100 students in the last 13 years. Some of those who benefited from the school program 13 years ago are now old enough to be Artesian customers.

As a result of these efforts, we have seen base load demand decrease 13.8 percent over the past ten years, from 324 gallons per customer daily (gpcd) in 1994 to 275 gpcd in 2004. This decline in customer consumption is indicative of the effectiveness of Artesian's decade old conservation efforts. Our customers proved they knew how to save water during the drought years we have experienced in this 10-year period. When asked to **voluntarily** conserve water during the 2002 drought, they were able to reduce consumption by as much as 10%.

Parsons, in their Staff report conducted on behalf of the Public Service Commission entitled "Investigation of Water Supply Availability in Northern New Castle, Delaware During the Drought of 2002," stated that "voluntary water conservation measures significantly reduced water demands on the Artesian system during the drought of 2002." Parsons further documented that demands during the spring of 2002 "were approximately 9 percent lower than demands reported for the same period during 2001" and "[T]hat comparison indicates that overall regional water demand was approximately

9 percent lower in July 2002 than July 1999, without considering the effects of growth over the 3-year period.” (page 4-10)

Because we had two “wet” summers in a row in 2003 and 2004, the incentive to save water decreased. In order to keep the conservation message in the forefront of our customers’ minds, we have stepped up our education efforts in the following manner.

- Included 6” rulers, as bill stuffers, in our quarterly bills for nine months starting in May 2005. These rulers illustrate how much water is “lost” each quarter according to the size of the leak and contain a water-conservation message. They serve as a handy reminder that fixing leaks promptly saves customers money and helps to preserve our water resources. Artesian sent these rulers out in increments of 7,500 per month until every residential homeowner received one. Our \$20,000 commitment under the settlement terms of PSC Complaint Docket No. 322-02 paid for 60,000 rulers (\$15,000) plus a portion of the increased mailing costs. The cost to Artesian of inserting them in with bills was an additional \$11,250.
- At the same time, a conservation message was printed in the “Important Message” area of our customers’ bills.
- Plans are underway to update our web site to contain links to other sources of conservation information, as well as conservation devices. In addition to devices such as reduced-flow showerheads, we also suggest water-efficient equipment, appliances and plumbing fixtures, such as low-flow toilets.
- Toilet-testing tablets are available at the Cashiers window for all customers who pay their bills in person.
- We continue to take our conservation message into schools and to community groups. We have a library of videotapes, including one produced by the PSC, to promote the wise use of water.
- We provide and staff our “water conservation” exhibit at community events such as Earth Day celebrations sponsored by the Delaware Solid Waste Authority at Killens Pond State Park and by New Castle County at Carousel Park. We take these opportunities to hand out sponges with a conservation message, “Conserve Water and Soak Up the Savings.”

- In June 2005 we participated in a Delaware Residential Energy Summit at the University of Delaware. We were part of a panel that emphasized the importance of conserving various resources and sources of energy, "Energized—On a Dime."
- We continue to perform "free" water audits upon request or when we see unusual water consumption.

As Artesian celebrates its 100th year of service, it is committed to taking whatever steps are necessary to protect our water resources and make sure that we have enough water for our next 100 years. Artesian believes that the above actions meet the water conservation provisions of the Self-Sufficiency Act.

III. ARTESIAN'S WATER SYSTEM

Overview

Artesian Water Company's water system service territory extends over 100 square miles in northern New Castle County. The Company serves about 66,000 metered customers in this portion of its service territory.

The portion of the water system located in northern New Castle County is divided into eight hydraulic service levels categorized by elevation changes. Water is readily transferred from one service level to another through a series of twelve booster pumping stations (transferring water from lower to higher pressure areas) and sixteen pressure reducing valves (transferring water from higher to lower pressure areas). As a result, the entire system is integrated and considered to be one system, regardless of where supplies and demands are located. A system map for this area is attached as **Exhibit 1**. Although Artesian integrated its northern New Castle County system with its system in southern New Castle County during 2004, no water is assumed to flow north or south through this main as part of this submission.

In northern New Castle County, Artesian's primary source of supply is groundwater, which is supplied from fifty-three operating wells. Artesian also has thirteen direct interconnections with other water suppliers, which augment its groundwater supply. Self-supply currently accounts for about 80 percent of Artesian's system delivery in this area; contractually required purchases through interconnections account for the remaining 20 percent.

With the exception of the Hockessin and Middle Run well fields, all of Artesian's wells are located in the Atlantic Coastal Plain. Sediments vary in thickness and uniformity, but generally consist of layers of sands, gravels, silts, and clays. With the exception of a few older wells in northern New Castle County, all of Artesian's wells are located in confined aquifers. This means that the sands from which these wells pump are physically separated from the ground surface by a significant clay barrier that protects against potential contamination from the downward leakage of impurities into the aquifer. Artesian also has a few older wells, which pump water from the water-table aquifer. The water table is the first water encountered from the ground surface when a well is drilled.

The Hockessin and Middle Run wellfields are located in the Piedmont Province, which is overlain by thin layers of unconsolidated sediments. In this region, wells are drilled into the underlying bedrock and intersect cracks and fissures connected to the ground surface. These cracks and fissures provide the water that is pumped.

The water supply from the Coastal Plain in northern New Castle County typically has low pH, high carbon dioxide, and is generally characterized as a soft water. The water supply from the Piedmont area has relatively high pH, low carbon dioxide, and is generally considered to be hard water. As a result of this mixed groundwater supply, Artesian has to employ a variety of treatment methods to meet state and federal water quality standards including aeration, pH adjustment, chlorination, fluoridation, and iron removal. In three instances (Airport Industrial Park, Llangollen, and Collins Park) granular activated carbon treatment has been added for the removal of synthetic organic compounds. Additionally, a corrosion inhibitor is added to all of the Company's self-supply and most of its interconnections. Artesian's water supply is treated at eighteen different locations in northern New Castle County.

In northern New Castle County, the Company has twenty storage tanks, with total system storage of 35 million gallons ("MG"), of which about 22 MG are available for use while still maintaining a minimum of 25 pounds per square inch ("psi") pressure to its customers. The water distribution system consists of more than 800 miles of pipeline ranging from 2-inches to 24-inches in diameter and more than 3,000 hydrants.

Water storage serves a number of purposes. First, it is used to maintain constant water pressure to our customers. Second, it is used to meet peak demands as they occur throughout the course of the day (typically during the morning and evening hours). Third, storage is available to meet emergency demands such as those that would arise in fighting a fire. Finally, storage makes water available during emergencies, such as in the event of a pump or electrical failure.

Existing Supply

Self-Supply

Production for each of the Company's wellfields in northern New Castle County over the past ten years is set forth in **Exhibit 2**. This information shows that pumpage

from Company-owned wellfields has increased over the past several years to the point where Artesian's reliance on purchased water is now significantly reduced. Equally important, Artesian's production from these wellfields is constrained by the actual demand upon its system. Therefore, historic production cannot be construed to be any limitation upon what these wellfields can actually produce.

Most of these wells and wellfields are limited in the amount of water that may be withdrawn by allocation permits issued by the DNREC. The constraints imposed by allocation permits are set forth in **Exhibit 3**. The first two columns identify each wellfield and well within the system. The third column shows the maximum allowable level in feet below ground surface (drawdown) to which pumpage from each well can lower the water level of the aquifer from which it is pumping. It must be noted that DNREC does not impose drawdown limits on wells pumping from the water table aquifer. In those instances, the limit presented in the exhibit is solely for use by Artesian personnel. For each well, the fourth and fifth columns reflect the maximum amount of water (in gallons per minute and million gallons per day) that each well may withdraw at any point in time. The sixth, seventh, and eighth columns show the maximum allowable withdrawal for the wellfield for any one day, any thirty-day period, and any year, respectively.

Generally, the wells and wellfields pump at rates less than the pumping limits set forth in the allocation permits. The wells and wellfields are limited in the amount they may withdraw for several reasons. First, well or wellfield total pumpage may not exceed permitted pumping limits. This limitation is imposed on an instantaneous, daily, monthly, and annual basis.

Second, water level drawdown of wells may not exceed permit limits. This regulatory constraint may reduce the amount of pumpage that can be realized from a well or wellfield to less than the permitted pumpage quantities. Given that the water levels of these wells are checked on a weekly basis and that water levels can vary significantly due to small variations in pumpage or changes in precipitation, it is important that some "margin of safety" be maintained between measured drawdown levels and levels permitted by allocation permit.

Finally, we can only pump wells to the extent that we have demand from our customers. Again, it is necessary that we purchase the minimum quantities of water not only to meet contractual obligations, but also to prudently manage our self-supply. Pumpage from our wellfields, therefore, is used to make up the difference between our minimum purchase quantities and actual system demand. Constraints on potential production from each wellfield are set forth in **Exhibit 4**.

The Public Service Commission, as part of PSC Docket No. 05-82, enlisted the services of the consulting firm of Leggette, Brashears & Graham, Inc. (LBG) to review Artesian's supply capacity. As part of that review, LBG reviewed historic production records from the period 1999 through 2004. LBG then used historic production as the basis for determining capacity for each of Artesian's wellfields in northern New Castle County. Their final report entitled "Assessment of March 8, 2005 Artesian Water Company Filing Under the Delaware Water Supply Self-Sufficiency Act," dated June 1, 2006 concluded that Artesian's "existing sources can meet all projected demands through 2006. Even with the largest single source out of service, the system has sufficient source capacity to meet peak demands during a recurrence of the drought of record." Attachment 1 to that report contained LBG's wellfield assessment for the years 2000 through 2004. A summary of this attachment is presented as **Exhibit 5**.

There are two wellfields where Artesian believes LBG significantly underestimated peak wellfield capacity. These are the Chesapeake City Road wellfield and the Llangollen ASR well.

Chesapeake City Road- LBG recommended a capacity for this wellfield of 2.70 MGD based upon a thirty day aquifer pump test conducted by Artesian for purposes of supporting Artesian's allocation application to DNREC. The purpose of this long-term pump test was to determine the effects of pumping regionally upon the aquifer. It was not intended to determine the maximum capacity of the wells within the wellfield. The wellfield, in total, was pumped at a rate of 2.70 MGD for the duration of the test. The firm of Demicco and Associates, Inc. oversaw the aquifer test and provided a report entitled "Aquifer Test Report for Brennan Wells 1 and 2 & Chesapeake City Road Wells 2 and 3" dated January, 2005. This report was provided to LBG in response to data request PSC-(1)-4 in PSC Docket No. 05-82. On page 21 of that report, Demicco states:

“In the Brennan wells, 570 gpm of remaining available well capacity exists. Therefore, the total pumping capacity for 30 days at the existing pump setting depths is as follows:

Brennan 1	690 gpm	30-day test rate
Brennan 2	550 gpm	30-day test rate
Chesapeake City Rd 2	220 gpm	30-day test rate
Chesapeake City Rd 3	430 gpm	30-day test rate
Brennan 1	370 gpm	additional capacity
Brennan 2	<u>200 gpm</u>	additional capacity
	2,460 gpm	Total Capacity”

Section 5.0 of the Demicco report is presented in **Exhibit 6**. This flow rate corresponds to 3.54 MGD. Artesian asserts that this documentation is adequate to rate the peak capacity of this wellfield at 3.50 MGD.

Llangollen ASR- LBG recommended a capacity for this well of 1.15 MGD, which coincides with Artesian’s actual operation of this recovery well over the past several years. Yet, this approach to determining “capacity” ignores the capacity of the well and the amount of water injected and available for recovery. Artesian has stored over 130 MG during the past two winter and spring seasons for recovery during the summer and fall. For purposes of determining the production rate during a 75-day drought of record, this quantity of water put into storage needs to be divided by 75 days to determine the actual peak production, in this case 1.73 MGD. Artesian’s actual recovery rate from this well has been dictated not by our pumping capacity, but rather by demand on the system. Artesian continues to assert that 1.6 MGD is the rightful capacity for this well.

Artesian’s self-supply from its own wells is presented in **Exhibit 7**. In summary, a total of 26.46 MGD of self-supply from Artesian’s wells is available to meet water demands during a recurrence of the 75-day drought of record. Of this quantity, 1.6 MGD is available from the Llangollen Aquifer Storage and Recovery (ASR) well (120 MG of storage used over 75 days). The remaining 24.86 MGD is from Artesian’s other production wells.

Interconnections

In northern New Castle County, Artesian maintains a total of thirteen interconnections with adjacent water utilities. These interconnections, along with their

hydraulic capacities, are presented in **Exhibit 8**. Although a number of these interconnections provide for the transfer of water in either direction (either to Artesian from a neighboring utility, or from Artesian to the neighboring utility), Artesian can purchase nearly 13 MGD during normal conditions and about 14 MGD during peak demand conditions, assuming the availability of supply by neighboring suppliers. Average day capacity is the amount of water that is available through each of these interconnections under normal demand conditions. Maximum month capacity reflects the hydraulic capacity of the interconnection to flow water. The interconnections, however, may be limited by the supply available to the provider during drought periods.

Artesian has contractual obligations to purchase water through two interconnections. Artesian has had an agreement with Chester Water Authority (CWA) for the purchase of water since 1990. This agreement requires Artesian to purchase a minimum of 3.0 MGD on an annual basis (1,095,000,000 gallons per year). Although the Company may purchase up to 6.0 MGD, it must purchase a minimum of 2.0 MGD on any given day. Under this contract, Artesian is treated as a customer and CWA may not curtail Artesian's purchases beyond any restrictions CWA may impose upon all of its customers. Artesian, therefore, considers its annual contractual minimum purchase to be 1.095 billion gallons (3 MGD) for purposes of Section 1404(e) of the Act. To suggest anything less than this quantity would penalize Artesian's customers by forcing them to pay for water that Artesian did not use. In other words, if the 3.0 MGD is not included in the Section 1404(e) certification, Artesian's customers will nevertheless pay for this quantity while also paying for an alternative supply to make up the difference. A copy of Artesian's contract with Chester Water Authority is presented as **Exhibit 9**.

Since 1989, Artesian has maintained a contract for water service with the City of Wilmington through an interconnection at Maryland Avenue. This interconnection agreement requires the City of Wilmington to provide up to 3.0 MGD to Artesian. In return, Artesian is obligated to purchase a minimum of 200 MG over the course of a calendar year. The contract contains a provision that requires Artesian to cease purchases any time the City has an "emergency." The City has invoked this provision in past droughts. A copy of Artesian's contract with the City of Wilmington is presented as **Exhibit 10**. Artesian recently informed the City of Wilmington of our intent to

renegotiate this contract to modify or eliminate the minimum contractual quantities of water which Artesian is required to purchase. This renegotiation has no bearing on Artesian's supply for purposes of this certification, since the City is not counted on to provide supply during drought conditions.

Over the longer term, Artesian has attempted to reduce the use of interconnections to supplement its supplies. For instance, Artesian's contractual interconnection with the City of Wilmington, which does not require a daily minimum take, is now being used primarily as a means of practicing conjunctive use. Water is being purchased during the winter and spring when streamflows are plentiful to allow for the recharge of Artesian's ASR well at Llangollen. This enables Artesian to meet its minimum purchase obligations without relying upon the City to meet summer demands. At the same time, the Company has also reduced pumpage of its own supplies for well resting and maintenance during the winter and spring.

All interconnections other than those with the CWA and the City of Wilmington at Maryland Avenue are typically used for emergencies and are available only to the extent that the provider has adequate supply available. Of these other interconnections, only the City of New Castle, whose source of supply is groundwater, may be considered reliable under drought conditions. Artesian has been able to reliably depend upon the City of New Castle for up to 700,000 gpd during drought periods in the past. For this analysis, the City of New Castle interconnection is considered to be available at a rate of 0.7 MGD.

To summarize, for purpose of this analysis, only the 3.7 MGD supply from Chester Water Authority and New Castle are considered available through Artesian's interconnections during a recurrence of a 75-day drought of record.

Storage

A description of Artesian's storage facilities in northern New Castle County is presented in **Exhibit 11**. All of the facilities in this exhibit are storage tanks that are distributed throughout Artesian's system in northern New Castle County. Since this is an integrated water system, all storage serves all customers within the system.

Additionally, Artesian has two aquifer storage and recovery (ASR) wells identified on Exhibit 1- the Llangollen ASR well and the Fairwinds ASR well. In 2001,

these wells stored 118.5 million gallons and 7.8 million gallons, respectively. During the summer of 2001, the total quantity of water recovered from these two wells was 113.7 million gallons and 7.7 million gallons, respectively. In 2002, the Llangollen ASR well stored 126 million gallons and 122 million gallons was recovered. The Fairwinds ASR well has been used as a production well since 2002. In 2003, the Llangollen ASR well stored 121 MG and recovered 96 MG during the summer. In 2004, the ASR well stored 124 MG and recovered 61 MG for distribution, due to the extremely wet weather and low customer demand. In 2005, the Llangollen ASR well stored an additional 94 MG (total of 157 MG in storage) and recovered 126 MG during the summer. In 2006, 130 MG has been stored at the Llangollen ASR well for recovery this summer. The recovery from the Llangollen ASR well is limited by total available volume in storage. Artesian has demonstrated that at least 120 MG of water can be stored and recovered from this well over the course of a drought period. Hence, for a 75-day drought of record period, an average of 1.6 MGD is available to be recovered from storage. This ASR recovery capacity is reflected in **Exhibit 7**.

Historic and Current Demand

A summary of historic delivery of water to the northern New Castle County system is presented in **Exhibit 12**. This table presents in column 2 the number of customers in northern New Castle County at the end of each calendar year for the past twenty-five years (since 1981). Columns 3 and 4 present the total production in million gallons for the year and average daily production, respectively. Column 5 presents the percentage increase or decrease in production from the previous year. Column 6 presents the average per customer delivery in gallons per day per customer for the year. Columns 7 and 8 present the maximum monthly water delivery for each year through the 25-year history in both MG/month and average MGD for the month, respectively. Column 9 presents the ratio of the maximum monthly production to the annual average production.

A number of observations are in order:

- The number of metered customers in northern New Castle County over the past 25 years has increased 80%, from 36,449 metered customers in 1981 to 66,272 metered customers at the end of 2005. There has been a 19% increase in metered customers over the past decade.

- Total system delivery to meet the needs of these customers has increased 64% over the past 25 years. System delivery, however, has increased only six percent over the past decade, with system delivery in 1996 of 17.54 MGD increasing to 18.59 MGD in 2005. In both instances, these increases are less than the corresponding increases in population for the respective periods.

- Per customer delivery has declined significantly and consistently over the past decade, from 317 gpcd in 1995 to 280 gpcd in 2005. This is a decline in per customer demand of 12 percent over the past decade, or a decline of more than one percent per year. Per customer water delivery since 1992 is presented graphically in **Exhibit 13**.

Projected Demand

The Self-Sufficiency Act very clearly states that Projected Demand “means the anticipated demand for water supply in the drought sensitive area during a drought of record in the projected year as determined for each water utility by the Water Supply Coordinating Council.” (26 Del.C., Section 1402(7)) The PSC order No. 6954 in PSC Docket No. 05-82 recognized the Water Supply Coordinating Council’s primacy in projecting demands when it stated “... determinations of projected demands are now within the bailiwick of the Water Supply Coordinating Council.” The Water Supply Coordinating Council (WSCC) published those demand projections on March 8, 2006 in its Eighth Report to the Governor and General Assembly, entitled “Updated Water Supply and Demand Projections for Northern New Castle County.” Table 1.2, Water supply and demand projections for northern New Castle County through 2009 depicts Artesian Water Company as having a supply of 29.0 MGD and a projected demand of 23.3 MGD, with a surplus of 5.7 MGD. In accordance with the Self-Sufficiency Act, the demand projected by the WSCC through 2009 of 23.3 MGD is relied upon in this certification.

Summary of Supply and Demand

The water supply and demand balance projected through the year 2009 is presented in **Exhibit 14**. To summarize, Artesian currently has a total water supply


capacity of 30.16 MGD (24.86 MGD from production wells, 1.60 MGD from ASR, and 3.7 MGD through interconnections with Chester Water Authority and New Castle) during a recurrence of the drought of record.

Given the 2009 projected demand through a drought of record of 23.3 MGD, as provided by the Water Supply Coordinating Council, Artesian would have a margin of safety of 6.86 MGD, or about 29 percent of projected maximum monthly demand.

Given the results of these supply/demand analyses conducted for the purpose of this self-certification of supply, it is concluded that Artesian's sources of supply are adequate to ensure that Artesian has the water supply capability necessary to meet its customers' needs during a recurrence of a 75-day drought of record.

IV. CERTIFICATION OF WATER SUPPLY SELF-SUFFICIENCY

I, Dian C. Taylor, do hereby certify that Artesian Water Company, Inc. has sufficient sources of water supply to meet projected demands through a drought of record in northern New Castle County through the year 2009.


Dian C. Taylor, President, CEO, Chair of the Board

6/29/06
Date

I, Bruce P. Kraeuter, do hereby certify that Artesian Water Company, Inc. has sufficient sources of water supply to meet projected demands through a drought of record in northern New Castle County through the year 2009.


Bruce P. Kraeuter, P.E., Vice President of Planning and Engineering

6/29/06
Date

EXHIBIT 1

Map
(See Original In
Docket)

Exhibit 2

Exhibit 2

ANNUAL WELLFIELD PRODUCTION

All values are annual average and expressed in MGD

WELLFIELD	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Northern New Castle County										
Airport Ind. Park	0.411	0.505	0.600	0.445	0.494	0.627	0.633	0.579	0.529	0.473
Artisans Village	2.383	2.498	2.372	2.220	2.044	2.39	2.428	2.548	2.600	2.600
Caravel Farms	0.134	0.171	0.184	0.193	0.221	0.214	0.200	0.176	0.120	0.001
Castle Hills	0.882	0.868	0.982	0.888	0.977	1.078	1.045	0.953	0.964	0.881
Chesapeake City								0.007	0.558	1.774
Collins Park	0.270	0.383	0.226	0.327	0.339	0.211	0.463	0.486	0.393	0.336
Eastern States	0.571	0.738	0.904	0.725	0.845	0.812	0.777	0.792	0.703	0.689
Fairwinds	1.363	1.379	1.278	1.243	1.292	1.234	1.253	1.257	1.336	1.209
Glendale	1.306	1.488	1.396	1.354	1.339	1.263	1.389	1.524	1.364	1.383
Hockessin	1.149	1.322	1.432	1.449	1.467	1.532	1.081	1.048	1.171	1.448
Jefferson Farms	0.643	0.590	0.722	0.773	0.762	0.785	0.722	0.638	0.664	0.744
Llangollen Estates	1.726	1.725	1.630	1.749	1.537	1.999	2.034	2.046	1.614	1.511
Middle Run				0.094	0.261	0.227	0.322	0.111	0.253	0.157
Midvale	0.204	0.167	0.307	0.266	0.299	0.182	0.157	0.074	0.142	0.091
Old County Road	1.519	1.356	1.772	2.092	1.8	2.161	1.988	1.762	1.941	1.719
Wilm. Airport	0.283	0.253	0.287	0.359	0.45	0.407	0.454	0.282	0.000	0.000
Wilm. Manor Gardens	0.274	0.489	0.470	0.464	0.417	0.319	0.350	0.367	0.341	0.372
Total	13.119	13.932	14.562	14.641	14.544	15.441	15.295	14.650	14.693	15.388

Exhibit 3

**ARTESIAN WATER COMPANY, INC.
NORTHERN NCC WELL FIELDS
ALLOCATION LIMITS**

Exhibit 3

Page 1

WELLFIELD	WELL #	MAX LEVEL (FEET)	MAX. GPM	MAX. PUMP GPD	MAX. PUMP 24HR	MAX. PUMP 30 DAYS	MAX PUMP. 1 YR.
Airport Industrial Park	1	100	250	360,000			
	2	97	250	360,000			
				Combined:	0.72 MG	21.6 MG	262.8 MG
Artisan's Village	1	130	1100	1,584,000			
	2	125	300	432,000			
	3	125	700	1,008,000			
	4	116	150	216,000			
				Combined:	3.024 MG	90.72 MG	1,088.64 MG
Caravel Farms	1	55	250	360,000	0.36 MG	10.8 MG	105.12 MG
Castle Hills	1	64' 3"***	100	144,000			
	2	94	250	360,000			
	3	97	600	864,000			
				Combined:	1.368 MG	42.408 MG	499.32 MG
Brennan Estates	1	320	900	1,296,000			
	2	360	750	1,080,000			
Chesapeake City	1**	97	50	50,000			
	2	95	225	324,000			
	3		550	792,000			
				Combined:	3.54 MG	106 MG	1275 MG

** ALLOCATION NOT APPLICABLE

*** NO MAXIMUM WATER LEVEL PER ALLOCATION PERMIT. INTERNAL LIMIT ONLY

**** ALLOCATION DID NOT SPECIFY A DAILY MAXIMUM

**ARTESIAN WATER COMPANY, INC.
NORTHERN NCC WELL FIELDS
ALLOCATION LIMITS**

Page 2

WELLFIELD	WELL #	MAX LEVEL (FEET)	MAX. GPM	MAX. PUMP GPD	MAX. PUMP 24HR	MAX. PUMP 30 DAYS	MAX PUMP. 1 YR.
Collins Park	1	94	400	576,000	0.576 MG	17.28 MG	180.0 MG
Eastern States	1	135	600	864,000			
	2	110	300	432,000			
				Combined:	1.29 MG	38.5 MG	365.0 MG
Fairwinds	2	120	370	532,800			
	4R	105	350	504,000			
	5	105	400	576,800			
	6	110	225	324,000			
	ASR	320	125	180,000			
				Combined:	2.0 MG	60.0 MG	720.0 MG
Glendale	2R	72**	350	504,000			
	4R	63**	100	144,000			
				Combined:	0.5 MG	15.0 MG	180.0 MG
	5	100	275	400,000			
	6	92	225	325,000			
	7	116	400	576,000			
				Combined:	1.301 MG	39.03 MG	474.865 MG
				Combined Wellfield Total:	1.801 MG	54.03 MG	654.0 MG

** ALLOCATION NOT APPLICABLE

*** NO MAXIMUM WATER LEVEL PER ALLOCATION PERMIT. INTERNAL LIMIT ONLY

**** ALLOCATION DID NOT SPECIFY A DAILY MAXIMUM

**ARTESIAN WATER COMPANY, INC.
NORTHERN NCC WELL FIELDS
ALLOCATION LIMITS**

Page 3

WELLFIELD	WELL #	MAX LEVEL (FEET)	MAX. GPM	MAX. PUMP GPD	MAX. PUMP 24HR	MAX. PUMP 30 DAYS	MAX PUMP. 1 YR.
Hockessin	G-1	125	400	****			
	G-3	115	300	****			
	1	120	425	****			
	2	200	425	****			
	3	120	425	****			
	4	100	700	****			
			Combined:	3.0 MG	3.0 MG	100.0 MG	693.50 MG
Jefferson Farms	1	94	700	1,008,000			
	2	92	200	288,000			
				Combined:	1.296 MG	38.88 MG	466.56 MG
Llangollen	G-3	98	620	892,000			
	K-1	95	600	864,000			
	2	120	320	460,800			
	6	110	600	864,000			
	7	97	600	864,000			
	ASR	92	1000	1,440,000			
				Combined:	2.218 MG	66.5 MG	720.0 MG
Middle Run	1	152	300	432,000			
	2	116	450	648,000			
				Combined:	1.08 MG	32.4 MG	394.2 MG

** ALLOCATION NOT APPLICABLE

*** NO MAXIMUM WATER LEVEL PER ALLOCATION PERMIT. INTERNAL LIMIT ONLY

**** ALLOCATION DID NOT SPECIFY A DAILY MAXIMUM

**ARTESIAN WATER COMPANY, INC.
NORTHERN NCC WELL FIELDS
ALLOCATION LIMITS**

Page 4

WELLFIELD	WELL #	MAX LEVEL (FEET)	MAX. GPM	MAX. PUMP GPD	MAX. PUMP 24HR	MAX. PUMP 30 DAYS	MAX PUMP. 1 YR.
Midvale	1	75 ***	200	288,000			
	2	67 ***	200	288,000			
				Combined:	0.576 MG	17.28 MG	207.36 MG
Old County Road	PW1	320	1000	1,440,000			
	PW2	413	1200	1,728,000			
				Combined:	3.16 MG	95.04 MG	720.0 MG
Wilmington	1	185	200	288,000			
Airport	2	208	200	288,000			
	3R	134	200	288,000			
				Combined:	0.864 MG	25.92 MG	311.04 MG
Wilmington Manor	1	35 ***	200	288,000			
Gardens	3	54'9" ***	350	492,000			
				Combined:	0.78 MG	23.40 MG	284.70 MG

** ALLOCATION NOT APPLICABLE

*** NO MAXIMUM WATER LEVEL PER ALLOCATION PERMIT. INTERNAL LIMIT ONLY

**** ALLOCATION DID NOT SPECIFY A DAILY MAXIMUM

Exhibit 4

Wellfield Constraints

Exhibit 4

Airport Industrial Park

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Artisans Village

Wellfield limited by allocation permit pumping limits and water level drawdown limits.

Caravel Farms

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Castle Hills

Wells #2 and #3 are used for normal operation at a rate reflecting actual production over the past several years. Well #1 is marginal and used only to meet summer peak demand. The wellfield is generally constrained by allocation permit water level drawdown limits.

Chesapeake City Road

Wellfield production reflects addition of new supply wells. Wellfield is limited by allocation permit pumping limits.

Collins Park

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Eastern States

Wellfield capacity is limited by allocation permit drawdown limits.

Fairwinds

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Glendale

Wellfield capacity is constrained by allocation permit water level drawdown limits. Well #4R may add a small increment of supply to meet peak demand.

Hockessin

Wellfield capacity is limited by allocation permit drawdown limits and actual demand in this part of Artesian's system. Wells G-1 and G-3 may be constrained by water quality and are used to meet peak summer demand.

Jefferson Farms

Wellfield capacity is constrained by allocation permit water level drawdown limits. Well #2 may add a small increment of supply to meet peak demand.

Llangollen

Wellfield limited by allocation permit pumping limits.

Middle Run

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Midvale

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Old Country Road

Wellfield capacity limited by allocation permit pumping limits.

Wilmington Airport

Wellfield limited by the capacity of the iron removal plant.

Wilmington Manor Gardens

Wellfield capacity is constrained by allocation permit water level drawdown limits.

Additionally, Well #1 is limited by water quality.

Exhibit 5

Exhibit 5

Summary of Leggette, Brashears & Graham Attachment 1

<u>Wellfield</u>	LBG Attachment 1 Max for Wellfield	LBG Attachment 1 Max for Wells
	<u>MGD</u>	<u>MGD</u>
Airport Industrial Park	0.78	0.81
Artisans Village	2.86	2.99
Caravel Farms	0.33	0.33
Castle Hills	1.25	1.27
Chesapeake/Brennan	2.70	2.70
Collins Park	0.50	0.50
Eastern States	0.95	0.95
Fairwinds	1.76	1.78
Glendale	1.78	1.90
Hockessin	2.50	2.50
Jefferson Farms	0.89	0.89
Llangollen	2.48	2.82
Middle Run	1.00	1.05
Midvale	0.34	0.34
Old County Road	2.90	2.83
Wilmington Airport	0.57	0.64
Wilmington Manor Gardens	0.69	0.70
Subtotal	24.28	25.00
Llangollen ASR	1.15	1.15
Total Self-Supply	25.43	26.15

Notes:

Max for Wellfield is the maximum month production for the entire wellfield over the reviewed history.

Max for Wells is the maximum month for each well and then summed for each wellfield.

Exhibit 6

**AQUIFER TEST REPORT
FOR
BRENNAN WELLS 1 AND 2
&
CHESAPEAKE CITY ROAD WELLS 2 AND 3**

Prepared for:

**Artesian Water Company, Inc.
664 Churchmans Road
Newark, Delaware 19702**

Prepared by:

**Demicco and Associates, Inc.
151 Old Franklin School Rd.
Pittstown, NJ 08867**



Peter M. Demicco, PG S4-0000406

January, 2005

5.0 AQUIFER ANALYSIS

The four wells in the 30-day aquifer test are completed in the lower, middle and upper aquifer zones of the Potomac Formation. The test wells have the following pump capacity and depth settings:

Brennan 1	800 gpm	262 foot setting
Brennan 2	700 gpm	315 foot setting
Chesapeake City Rd 2	250 gpm	94 foot setting
Chesapeake City Rd 3	<u>550 gpm</u>	210 foot setting
	2300 gpm	

The following summarized the test flow rate, pumping level and 30-day specific capacity at the end of the 30-day test with the wells at Old County Road operating:

Brennan 1	690 gpm	210 foot level	8.85 gpm/ft
Brennan 2	550 gpm	265 foot level	4.01 gpm/ft
Chesapeake City Rd 2	220 gpm	86 foot level	3.61 gpm/ft
Chesapeake City Rd 3	<u>430 gpm</u>	200 foot level	6.32 gpm/ft
	1890 gpm		

The following summarizes the remaining available drawdown above the existing pump setting and the additional well capacity based on the 30-day specific capacity. This includes an additional 10 feet of interference drawdown that might occur over several months of pumping:

Brennan 1	42 foot	370 gpm
Brennan 2	40 foot	200 gpm
Chesapeake City Rd 2	0 foot	0 gpm
Chesapeake City Rd 3	0 foot	0 gpm

In the Brennan wells, 570 gpm of remaining available well capacity exists. Therefore, the total pumping capacity for 30-days at the existing pump setting depths is as follows:

Brennan 1	690 gpm	30-day test rate
Brennan 2	550 gpm	30-day test rate
Chesapeake City Rd 2	220 gpm	30-day test rate
Chesapeake City Rd 3	430 gpm	30-day test rate
Brennan 1	370 gpm	additional capacity
Brennan 2	200 gpm	additional capacity
	2,460 gpm	Total Capacity

In addition, the pumps can be lowered in each of the Brennan Wells and at Chesapeake City Road Well 3. Chesapeake City Road 2 is at its capacity at 220 gpm.

If a 350 foot pump setting is assumed, additional pumping capacities from all the wells except Chesapeake City Road 2 can be developed. The following presents the additional available drawdown beyond the end of the 30-day test (the total available drawdown from static water level) with an assumed pump setting of 350 feet:

Brennan 1	140' available (220' total)	210 foot level, 30 day test
Brennan 2	85' available (225' total)	265 foot level, 30-day test
Chesapeake Ct Rd 3	150' available (230' total)	200 foot level, 30-day test

With the additional pumping, some decrease in well efficiency will occur. As Brennan Well 2 was observed to be very efficient in the step test, only a small decline in specific capacity is assumed. Brennan Well 1 and Chesapeake City Road Well 3 are assumed to lose 25 percent of their specific capacity at the higher flow rates. However, to obtain the yield from Chesapeake City Road Well 3, a new larger diameter well will have to be installed. This well will have a higher specific capacity and higher efficiency than the existing Well 3. Using the existing Chesapeake City Road Well 3 specific capacity, the new 30-day specific capacity rates for the higher flow rates with an assumed 350 foot pump level are as follows:

Brennan 1	8.85 gpm/ft, observed	6.6 gpm/ft assumed
Brennan 2	4.01 gpm/ft observed	3.8 gpm/ft assumed
Chesapeake City Rd 3	6.32 gpm/ft observed	4.7 gpm/ft assumed

Based on these assumed specific capacities, the following maximum pumping rates with a 350 foot pump setting, except Chesapeake City Road Well 2, are as follows:

Brennan 1	1450 gpm
Brennan 2	850 gpm
Chesapeake City Rd 2	220 gpm
Chesapeake City Rd 3	<u>1080 gpm</u>
	3,600 gpm

The observed impacts on the distant observation wells are summarized below:

Old County Road PW-1	7 feet
Old County Road PW-2	7 feet
Frenchtown Rd, TW-2, Md.	no observed effects
Denny Road	10 feet
Lums Pond B, C, D	no observed effects
Elk Forest, Md	3 feet

To evaluate the observed effects, distance versus drawdown graphs for each production well were developed based on the Theis non-equilibrium formula. The aquifer transmissivity was obtained from the 72-hour test data, and a storage coefficient of 0.0001 was used for each plot. The 30-day test flow rates were used in the construction of each graph. The Theis graphs do not include effects of vertical leakage. The graphs are as follows:

Figure 52	Brennan Well 1
Figure 53	Brennan Well 2
Figure 54	Chesapeake City Rd. Well 2
Figure 55	Chesapeake City Rd. Well 3

The distances, based on Figure 2, from the Brennan Well 1 to the observation wells in the middle Potomac aquifer and projected interference are as follows:

Denny Road	6,200 feet	12 feet of interference
Old County Road PW-1	9,050 feet	10 feet of interference
Lums Pond C	15,000 feet	7 feet of interference
Elk Forest, Md.	21,000 feet	4 feet of interference
Frenchtown Rd	22,650 feet	3 feet of interference

Exhibit 7

Exhibit 7**COMPANY-OWNED SUPPLY CAPACITY
Northern New Castle County**

Wellfield	CAPACITY (MGD)	
	Average	Max Month
Airport Industrial Park	0.53	0.78
Artisans Village	2.60	2.90
Caravel Farms	0.20	0.33
Castle Hills	0.96	1.25
Chesapeake City Rd	3.00	3.50
Collins Park	0.40	0.50
Eastern States	0.80	0.95
Fairwinds	1.30	1.76
Glendale	1.36	1.78
Hockessin	1.50	2.50
Jefferson Farms	0.75	0.90
Llangollen	1.70	2.20
Llangollen ASR	0.00	1.60
Middle Run	0.25	1.00
Midvale	0.15	0.34
Old County Road	2.00	2.90
Wilm. Manor Gardens	0.40	0.57
Wilm. Airport	0.35	0.70
Total Well Field Capacity	18.26	26.46

Exhibit 8

Exhibit 8

INTERCONNECTION CAPACITY- Northern New Castle County

<u>INTERCONNECTION</u>	CAPACITY (MGD)	
	<u>Average</u>	<u>Max Month</u>
City of Wilmington		
Moorehouse Ln. (Note 1)	--	--
Cleveland & Taft	0.5	0.7
S. Heald St.	1.0	1.5
Maryland Ave.	3.0	5.0
United Water Delaware		
Newport Heights	2.0	0.0
Churchmans Rd.	1.0	0.0
First State Ind. Park	1.0	0.0
Red Lion (Note 1)	--	--
Pleasant Valley Rd.	0.7	0.0
City of New Castle		
School Lane	0.5	0.7
Lukens Drive (Note 1)		
City of Newark (Note 1)	0.0	0.4
Chester Water Authority	3.0	6.0
<hr/>		
TOTAL INTERCONNECTIONS	12.7	14.3

Note 1: For emergency use.

Exhibit 9

cc Tom M.

Exhibit 9

ADDENDUM TO INTERCONNECTION AGREEMENT

This Addendum, made as of the 1 day of ^{August}~~July~~, 1997 ("Addendum"), and which becomes effective upon execution by both parties, is intended to modify an Agreement dated June 6, 1990 ("Existing Agreement") between Chester Water Authority, a municipal authority organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 5th & Welsh Streets, Chester, Pennsylvania, with its principal office at 5th & Welsh Streets, Chester, Pennsylvania 19106 ("Chester"), and Artesian Water Company, Inc., a corporation organized and existing under the laws of the State of Delaware, with its principal office at 664 Churchmans Road, Newark, Delaware 19702 ("Artesian") (the "Existing Agreement" and this "Addendum" hereinafter collectively referred to as the "Agreement").

W I T N E S S E T H:

WHEREAS, Chester and Artesian have obtained regulatory approvals necessary to modify Existing Agreement in accordance with (1) Delaware River Basin Commission ("DRBC") Docket No. D-84-10-CP,

Supplement No. 3; (2) Pennsylvania Department of Environmental Protection, Pennsylvania DEP Permit No. WA-23-275-B (permit issued December 6, 1996); (3) Susquehanna River Basin Commission ("SRBC") Application No. 1996, 1004 (approval dated November 26, 1996); and

WHEREAS, Chester and Artesian wish to modify the following Sections of Existing Agreement as follows:

Modified Section 2.2, Commencement And Option To Extend Term. Chester's deliveries and Artesian's purchases of the Supplies (as described at Section 2.3 hereof) shall commence on the effective date of the Addendum and continue through and including December 31, 2021. Artesian has the right, subject to all requisite regulatory and governmental approvals, to extend the term of this Agreement through and including December 31, 2047 (the "Option") by giving Chester written notice on or before December 31, 2019 that it elects to extend the term of this Agreement, and Chester shall take all necessary steps, including, without limitation, seeking regulatory and governmental approvals in a timely manner, to assure that, at a minimum, supplies in the amounts provided for in this Agreement are available to Artesian at such time as it may elect to extend the term of this agreement through 2047. If Chester is unable to obtain, on or before December 31, 2021, all necessary regulatory and governmental approvals and permits necessary to permit Chester to

deliver Supplies to Artesian beyond December 31, 2021, then the Interconnection Agreement, dated June 6, 1990, as modified by this Addendum shall terminate as of December 31, 2021.

Modified Section 2.3, Monthly Supply/Purchase Obligations.

Subject to the terms and conditions of this Article II, and commencing on the effective date of the Addendum, Chester shall deliver and Artesian shall purchase annually a minimum amount of water. For the period from the effective date of the Addendum through December 31, 1997, the minimum amount to be purchased by Artesian shall be the number arrived at by multiplying 3.0 million gallons by the total number of days from the effective date of the Addendum through December 31, 1997. For each of the years 1998 through 2021, or any subsequent year pursuant to Artesian's exercise of its Option under Section 2.2, the minimum amount shall be the number arrived at by multiplying 3.0 million gallons by the number of days in such calendar year. The amount purchased by Artesian may, on any one day, be no less than 2.0 million gallons, as long as the minimum amount to be purchased annually, as calculated above, is purchased by Artesian in that calendar year; provided, however, that Artesian may purchase less than the minimum annual amount of water by a quantity/amount which is equal to that quantity/amount that Chester is unable to deliver for any reason as requested by Artesian

consistent with Section 2.4 hereof or that does not satisfy any of the water quality standards described in Section 2.11(i) through (iv). Artesian has no obligation to pay for water which, for any reason, Chester fails to deliver to Artesian or which fails to satisfy any of the water quality standards described in Section 2.11(i) through (iv). As of January 1, 2015, Artesian has the right, upon thirty (30) days' prior written notice to Chester, to adjust the minimum amount of water it purchases from Chester up to the maximum amount allowed annually under Section 2.4, to be calculated consistent with the terms of Section 2.3

Modified Section 2.4, Peak Supply Capacity. From the effective date of the Addendum until December 31, 2021, or subsequent extension, and subject to the terms of this Article II, Artesian shall have the right to take, and Chester shall be obligated to deliver, the Supplies in amounts up to but not exceeding 6.0 million gallons per day based upon a thirty (30) day average, providing Artesian is purchasing 3 million gallons per day on an annual average basis. Artesian shall have the right to take higher levels for peaking purposes, based on a two (2) to one (1) ratio (peak to average day), only after it shall have established a higher average per day purchase in the preceding twelve (12) month period and after Chester shall have had sufficient opportunity to analyze and install

and does in fact install the physical equipment in its system to accommodate the increased flow. For example, if the proper equipment were installed and if Artesian had purchased an average of 3.5 million gallons per day in the preceding twelve (12) month period the Company would be permitted to peak in the following twelve (12) month period up to 7 million gallons per day. This provision, however, shall not increase or cause the Company to exceed a peak of 6 million gallons per day based upon a thirty (30) day average.

If Chester or Artesian are unable to obtain the necessary regulatory approvals to satisfy the higher peaking level requirement in Section 2.4 then Chester shall have no obligation to provide this higher peaking level requirement.

Modified Section 2.8, Water Pressure At Interconnection.

Water pressure at the interconnection will be approximately sixty-five (65) pounds per square inch ("psi") as measured at the interconnection.

Modified Section 2.10, Charges And Billing Procedures.

{Substitutes for current Sections 2.10.1, 2.10.2, and 2.10.3.} The interconnection meter shall be read on a monthly basis, at a date and time predetermined and agreed to by Chester and Artesian annually, and Chester shall bill Artesian based in accordance with the terms of this Agreement and Chester's then current rates, rules, and

regulations. The rates charged Artesian for wholesale or bulk water purchases shall be cost-based and shall rely on a cost-of-service analysis using utility-basis of rate-making which conforms with water industry practice and standards. Chester's rates and rate structure shall fairly allocate Chester's cost of service and shall not result in Artesian subsidizing the cost of operating Chester's system to the benefit of any class of customers, except as may be permitted in applying water industry cost-of-service standards.

Modified Section 2.13, Rate Changes. During the term of this Addendum, or any extension thereof, Chester shall provide Artesian with ninety (90) days' prior written notice of Chester Water Authority Board action to change Chester's then-current tariff rates, rate structure, and/or rules, regulations, or other standards for service.

Modified Section 2.14, Term. The parties' obligations under this Article II shall commence as of the effective date of the Addendum and shall continue through December 31, 2021, except as otherwise provided by Section 2.2 and Section 2.5.

IN WITNESS WHEREOF, the parties hereto have caused this Addendum to be executed and delivered, and their duly authorized officers, as of the day and year first written above.

CHESTER WATER AUTHORITY

Attest:

Leo S. Holmes (Seal)
Secretary

By: Peter K. Mac Ewen
Peter K. Mac Ewen
Executive Manager
And Chief Engineer

Date: August 1, 1997

ARTESIAN WATER COMPANY, INC.

Attest:

Dian C. Taylor (Seal)
Treasurer

By: Dian C. Taylor
Dian C. Taylor
President, CEO and
Chair of the Board

Date: August 1, 1997

INTERCONNECTION AGREEMENT

THIS AGREEMENT, made as of the 6th day of June, 1990, is by and between the CHESTER WATER AUTHORITY, a municipal authority organized and existing under the laws of the Commonwealth of Pennsylvania with its principal office at Fifth and Welsh Streets, Chester, Pennsylvania 19016 ("Chester"), and ARTESIAN WATER COMPANY, INC., a corporation organized and existing under the laws of the State of Delaware with its principal office at 666 Churchmans Road, Newark, Delaware 19702 ("Artesian").

WHEREAS, Chester owns and operates a waterworks and furnishes water service to the public and other water distributors in portions of Chester, Delaware and Lancaster Counties, Pennsylvania, and New Castle County, Delaware;

WHEREAS, Artesian owns and operates a public water utility for the supply and distribution of water in various portions of New Castle County, Delaware;

WHEREAS, Artesian desires to purchase bulk water supplies ("Supplies") from Chester for resale to its jurisdictional customers, and Chester is willing to sell such Supplies to Artesian under the terms and conditions hereinafter set forth;

WHEREAS, Artesian and Chester have obtained those regulatory approvals that are required for the delivery and sale by Chester, and the receipt and purchase by Artesian, of the Supplies as more fully set forth in (i) Resolution 89-10

of the Susquehanna River Basin Commission, dated July 13, 1989, (ii) Docket No. D-84-55CP of the Delaware River Basin Commission, dated August 4, 1989, and (iii) Water Allocation WA-275B of the Pennsylvania Department of Environmental Resources, dated August 14, 1989 (collectively, the "Supply Permits"); and

WHEREAS, the parties wish to set forth their agreement for the construction and financing of the interconnection and associated improvements by which Chester will deliver the Supplies to Artesian ("Facility") and their agreement as to delivery, receipt and payment for the Supplies;

NOW THEREFORE, in consideration of these premises and of the mutual promises and undertakings hereinafter set forth, the parties hereto, intending to be legally bound hereby, agree as follows:

ARTICLE I The Facility

1.1 Description of the Facility. The Facility to be constructed is shown and described in Chester Drawing No. 2357, which appears as Exhibit 1.1 hereto and is incorporated herein by reference ("Plan"). The Facility shall include, but not be limited to, a booster pumping station with pumps, related equipment and appurtenances, a single 20-inch transmission main which shall be tapped into Chester's 48-inch transmission main and connected to Artesian's distribution system at the boundary line between Pennsylvania

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and Delaware as shown in the Plan, and all required equipment and improvements, metering vault, meters, and associated regulators and controls.

1.2 Undertaking To Build. Subject to the terms and conditions set forth in this Agreement, Chester shall design, construct, build and install the Facility in Kennett or New Garden Townships, Chester County, Pennsylvania. Chester shall supply or arrange for the provision and/or performance of all required services, goods, materials, engineering and construction (collectively, the "Work") needed to complete the Facility in a sound and workmanlike fashion. For purposes of this Article I, the "Work" shall be deemed to include and comprise the completed design, engineering and construction required by this Agreement and the Project Documents (as hereinafter defined).

1.3 The Project Documents. The Project Documents include all drawings, specifications, contracts, subcontracts, blueprints, supplier and materialman agreements, schedules, progress schedules, change orders, budgets, requests for proposals, bid solicitations, proposals, other similar documents or agreements, and all amendments, addenda and supplements thereto, whether now existing or hereafter issued, which relate to, reflect or memorialize the Work.

1.4 Selection of Contractors and Materialmen. Chester shall provide Artesian with copies of all written documentation pertaining or relating to the selection and hiring of contractors and materialmen for the various portions of the Work including, but not limited to, requests for proposals, bid solicitations, bids, responses to bid solicitations and all other proposals or offers received by Chester for any portion of the Work. Artesian shall be given reasonable opportunity to consult with Chester in the review of such bids, responses, proposals and offers, and shall be advised of, and allowed to attend all bid openings and other meetings at which any portion of the Work will be awarded. Where the Work (or any portion thereof) is let for bid or is the subject of a request for proposals, such shall be awarded on the basis of the lowest responsible bid or proposal. Notwithstanding the foregoing, Artesian understands, acknowledges and agrees that Chester shall have final authority over the selection of contractors and materialmen for the Work, and the right to reject any one or more bids for the Work, or any portion thereof. The rights reserved to Chester under this Section 1.4 shall be exercised in good faith and on a reasonable basis, and the exercise of such rights shall not excuse Chester's obligation to proceed with, and complete the design, construction and operation of the Facility in accordance with the terms hereof (except as otherwise provided at Section 1.17).

1.5 Designs And Specifications. Copies of all designs, specifications, drawings, materials, schedules, budgets, blueprints, and engineering for the Work shall be supplied to Artesian for review and comment prior to finalization.

1.6 Supervision Of The Work. Except as otherwise provided herein, Chester shall have the right and obligation to supervise and control the Work including, but not limited to, the determination of construction means, methods, techniques, sequences and procedures; monitoring and enforcement of compliance with the Project Documents; approval and acceptance of the Work; and the review, approval and processing of applications for payment to contractors and materialmen engaged on the Work. Chester undertakes to perform these functions in a sound and prudent fashion in order to assure completion of the Work in accordance with the Project Documents at a reasonable cost.

1.7 Maintenance Of Records. Chester shall maintain full and complete records with respect to the Work and Artesian shall at all times be allowed reasonable access to, and opportunity to inspect such records.

1.8 Access To The Work. Artesian shall at all times be allowed reasonable access to, and opportunity to inspect the Work.

1.9 Enforcement Of The Project Documents. Chester shall use reasonable care under the circumstances to assure compliance with, and due performance under the Project Documents by all contractors and materialmen hired for the Work. Chester shall promptly advise Artesian of all instances of noncompliance and/or defective performance and the measures proposed by Chester in respect of actions to cure, enforcement of the Project Documents and available remedies against the responsible party.

1.10 Payments To Contractors And Materialmen. Chester shall be responsible for, and shall have authority to process and make payments to contractors and materialmen in respect of the Work. Chester shall process and make such payments only in accordance with the Project Documents. Artesian shall be promptly advised in writing of any proposed change order or other amendment to the Project Documents when and as such are approved or accepted by Chester.

1.11 Artesian Payments To Chester.

1.11.1 Artesian shall pay to Chester fifty percent (50%) of the Shared Costs of the Work (as hereinafter defined) in accordance with this Section 1.11.

1.11.2 The "Shared Costs" of the Work shall consist of the charges of contractors and

materialmen under the Project Documents (as approved and accepted by Chester in accordance with the terms hereof and of the Project Documents) for: (a) the connection to Chester's 48" transmission main; (b) the booster pumping station and appurtenant facilities; (c) an estimated 20,000 feet of transmission main to the point of interconnection with Artesian's distribution system; and (d) the metering vault at such point of interconnection.

1.11.3 Shared Costs for purposes of this Section 1.11 shall not include any direct or indirect charge, cost, expense or other allocation, however described or denominated, for any of the following: (a) Chester staff, resources and overhead; (b) engineering for the Work; (c) inspection of the Work; (d) acquisition of required rights of way, easements, fee interests or other real estate acquisition costs (including costs incurred for condemnation and takings by eminent domain, as applicable); (e) costs and fees associated with obtaining any permit or license required for the Work under federal, state or local law, statute, ordinance, regulation or other similar authority; or (f) equipment costs for the meter and related

equipment (but not to include the meter vault) at the point of interconnection.

1.11.4 Within 14 days after the end of each calendar month during which the Work is in process, Chester shall bill Artesian in arrears for fifty percent (50%) of the Shared Costs (less any applicable retainage) actually incurred and paid by Chester during the prior month. Chester's invoice to Artesian shall be accompanied and supported by documented proof of the invoiced amounts and the prior payment of such amounts by Chester in accordance with the Project Documents. Artesian's payment of the invoiced charges shall be remitted to Chester within 14 days following receipt.

1.11.5 Chester's records of costs incurred in connection with, and payments made on account of the Work shall be available to Artesian for review and audit at all times, upon reasonable request.

1.11.6 Artesian's aggregate payments to Chester on account of Shared Costs under this Section 1.11 shall in no event exceed the total sum of One Million Five Hundred Thousand (\$1.5 million) Dollars. Chester shall absorb and shall be solely responsible for the payment of any remaining Shared Costs, and no charge on account thereof shall be made to Artesian.

1.12 Delaware Improvements. This Agreement does not govern nor shall it be construed to include the distribution system improvements to be designed and constructed by Artesian within the State of Delaware ("Delaware Improvements") for interconnection with the Facility. Artesian shall be solely responsible for the Delaware Improvements and all costs and charges incurred in connection therewith. The cost of connecting the Facility to the Delaware Improvements shall be included in the Shared Costs for purposes of Section 1.11, subject however to the excluded equipment costs (to be absorbed by Chester alone) described at Section 1.11.3(f).

1.13 Option Agreement. Artesian shall assign or cause to be assigned to Chester all its right, title and interest in, to and under that certain Option Agreement by and between Artesian Water Company and Hartefeld, L.P., dated September 21, 1983, as amended by an Addendum To Option Agreement, dated September 18, 1986, true, complete and correct copies of which appear at Exhibit 1.13 hereto and are incorporated herein by reference (collectively, the "Option"). At its sole cost and expense, Chester shall accept, hold and exercise the Option for the purpose of acquiring necessary easement rights for construction of the Facility. Artesian acknowledges that the Option continues to be valid and binding and has not been terminated by either party thereto.

1.14 Booster Station Site. At its sole cost and expense, Chester shall acquire a suitable parcel of land in Kennett or New Garden Township for the construction of the booster pumping station to be made a part of the Facility and will exercise its powers of condemnation and eminent domain as necessary or desirable for this purpose.

1.15 Engineering Services. At its sole cost and expense, Chester shall provide or arrange for the securing of all necessary engineering design services, studies, surveys, preparation of plans, drawing and technical specifications, construction inspection services, contract administration and other additional engineering services as may be required for purposes of the Work.

1.16 Permits And Licenses. At its sole cost and expense, Chester shall obtain any permits, licenses or other authorizations required under any federal, state or local law, statute, rule, regulation, ordinance or other authority for the Work.

1.17 Project Budget And Schedule. The parties recognize that the total costs of the Work (including both the Shared Costs and also those costs for which Chester is solely responsible) are not presently determinable, and have proceeded on the assumption that such costs shall total

approximately Three Million (\$3.0 million) Dollars. The parties mutually agree and undertake to use their best efforts to minimize the costs of the Work consistent with their commitment to secure completion of the Facility on a timely basis in accordance with the Project Documents. To this end, Chester shall regularly prepare and submit to Artesian a Project Budget and schedule for completion of the Work, in form reasonably acceptable to Artesian and in accord with accepted construction management practices for similar projects. The Project Budget and schedule shall be updated for any material change encountered in the course of the Work, and in any event shall issue on not less than a quarterly basis. If at the time of bid opening for the Work needed to complete the Facility, the cost to complete the Facility exceeds \$3.9 million, Chester shall have the right to reject all bids and terminate this Agreement by written notice to Artesian and in such event this Agreement shall become null and void and neither party hereto shall have any further obligation and liability hereunder to the other.

1.18 Ownership of the Facility. Notwithstanding Artesian's payments to Chester for construction of the Facility as provided herein, Chester shall own the Facility and shall have all right, title and interest thereto.

1.19 Maintenance of the Facility. Following completion of the Facility, it shall be Chester's responsibility to maintain and repair the Facility.

ARTICLE II Interconnection Deliveries

2.1 Sale And Purchase Of Supplies. In accordance with this Article II, Chester shall deliver and sell, and Artesian shall receive and purchase the Supplies through the Facility.

2.2 Commencement. Chester's deliveries and Artesian's purchases of the Supplies (as described at Section 2.3 hereof) shall commence for an initial one-year term ("Initial Term") on the first day of the month next following the date on which the Facility is completed, connected with the Delaware Improvements and placed into commercial operation. Chester's deliveries and Artesian's purchases of the Supplies shall thereafter continue for successive one-year renewal terms ("Renewal Terms") through the date on which this Agreement expires or otherwise is terminated. Each successive Renewal Term shall automatically commence upon the expiration of the preceding Initial or Renewal Term, as applicable.

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2.3 Monthly Supply/Purchase Obligations. Subject to the terms and conditions of this Article II, Chester shall

deliver and Artesian shall purchase Supplies in the following described quantities (millions of gallons or "MG") for the Initial Term and the Renewal Terms indicated below:

<u>Term</u>	<u>Monthly Delivery (MG)</u>
Initial	58.3
2d	75.0
3d	91.6
4th	108.3
5th And Subsequent Renewal Terms	121.6

2.4 Peak Supply Capacity. Subject to compliance with the Supply Permits (under which deliveries to Artesian may not exceed 4.0 million gallons per day ["MGD"] based on a thirty-day average), and subject also to the terms of this Article II (including, but not limited to, the monthly supply/purchase obligations specified in Section 2.3 above), Artesian shall have the right to take, and Chester shall be obligated to deliver the Supplies in amounts up to, but not exceeding, the following maximum daily deliveries during the Initial Term and the Renewal Terms:

<u>Term</u>	<u>Maximum Daily Delivery (MG)</u>
Initial	3.0
2d	3.8
3d	4.5
4th	5.5
5th And Subsequent Renewal Terms	6.0

2.5 Regulatory Permits. The parties' respective obligations to deliver and purchase the Supplies under this Article II are subject to and conditioned upon continued regulatory approval of those governmental agencies having jurisdiction. It is expressly understood, acknowledged and agreed that the continued delivery and purchase of the Supplies is conditioned upon and subject to the Supply Permits. Should any of the Supply Permits be modified, terminated, rescinded or otherwise materially changed so as to reduce, prohibit or condition (in a manner unacceptable to either of the parties) the continued delivery and purchase of the Supplies, then Chester's obligation to deliver and Artesian's obligation to purchase under this Article II shall be excused or, if volumes under the Supply Permits are reduced, such obligations shall likewise be reduced.

2.6 Delivery Curtailments. If at any time Chester finds that it is necessary to curtail deliveries to other utilities within Chester's service area, the Supplies to be delivered to Artesian may likewise be curtailed, but only in the same proportion and to the same extent and in common with all other utilities purchasing water from Chester. Chester's minimum delivery obligation and Artesian's minimum purchase obligation shall be ratably adjusted on an equitable basis as necessary to reflect the impact of curtailments under this Section 2.6.

2.7 Force Majeure. If either Chester's ability to deliver or Artesian's ability to receive the Supplies is interrupted or impaired, in whole or in part, due to failure of equipment or facilities, leaks, required repairs to facilities, strikes, Acts of God, or other extraordinary circumstances, occurrences or conditions beyond the parties' control, then during the period of such interruption or impairment, the minimum delivery and purchase obligations described herein shall be suspended proportionately. Artesian specifically acknowledges, understands and agrees that Chester's obligation to deliver the Supplies requires only the exercise of ordinary and reasonable care under the circumstances to maintain the Supplies and have such available for delivery hereunder, and that Chester shall not be liable to Artesian for any interruption of, or curtailment in the Supplies caused by circumstances beyond its control. Chester shall, however, notify Artesian immediately when any interruption or curtailment in delivery of the Supplies is experienced or anticipated.

2.8 Water Pressure At Interconnection. Water pressure at the interconnection is anticipated to be approximately fifty-five (55) pounds per square inch (psi), but Chester offers no guarantee other than to provide reasonable pressure under the circumstances.

2.9 Meter Readings and Tests. Chester, at its expense, shall test the interconnection meter at least annually with the results thereof provided to Artesian. Upon request, a representative of Artesian may witness the meter test. The cost of any meter tests performed at the request of Artesian, other than the annual test, shall be paid by Artesian. If the meter is found to register inaccurately beyond a range of tolerance of three percent (3%), an adjustment shall be made to the bills rendered for service through the interconnection for the period equal to one-half (1/2) the time elapsed since the last previous meter test.

2.10 Charges And Billing Procedures.

2.10.1 For billing purposes, the interconnection meter shall be read monthly by Chester, and Chester shall bill Artesian in arrears based on the greater of (i) volumes delivered, or (ii) the agreed minimum purchases for the period as shown at Section 2.3 hereof. Payment of the invoiced amount, less any applicable discount for prompt payment, shall be remitted by Artesian, as due, in accordance with Chester's then current tariff, rules and regulations.

2.10.2 Within sixty days following the expiration of each of the first five annual terms of this Agreement as described at Section 2.2 above,

Chester shall refund to Artesian an amount equal to ten percent (10%) of the gross charges billed to Artesian under Section 2.10.1. In no event shall the aggregate amount of refunds under this Section 2.10.2 exceed the total amount of Artesian's payments to Chester for the Shared Costs of the Facility under Article I hereof.

2.10.3 Chester's bill to Artesian under Section 2.10.1 for any month in which Artesian has purchased volumes in excess of the applicable minimum purchase commitment shown at Section 2.3 hereof ("Excess Purchases") shall reflect a credit equal in amount to the Minimum Purchase Charges, if any, billed to Artesian for service during the prior monthly billing period; provided, however, that the credit shall not exceed the amount which otherwise would be currently payable by Artesian for the Excess Purchases. For purposes of this Section 2.10.3, the term "Minimum Purchase Charges" shall mean amounts billed to Artesian for any shortage in volumes taken during the prior monthly billing period as compared with the applicable minimum purchase obligation for that period under Section 2.3.

2.11 Water Quality. Chester warrants that the Supplies furnished hereunder shall be potable and in compliance with all applicable federal and Commonwealth of Pennsylvania legislation and regulations in effect at the time the Supplies are delivered to Artesian (collectively, the "Water Quality Laws"). Chester shall immediately notify Artesian of any experienced or anticipated change in the condition or characteristics of the Supplies which would: (i) cause the Supplies to deviate from, or otherwise fail to comply with the Water Quality Laws; (ii) cause the Supplies to deviate from, or otherwise fail to comply with the Delaware Standards (as hereinafter defined); (iii) require disclosure to regulatory agencies having jurisdiction, Artesian's customers and/or the public in general pursuant to either the Water Quality Laws or the Delaware Standards; and/or (iv) result in a noticeable difference in the odor, taste or other quality of the Supplies. For purposes of this Section 2.11, the "Delaware Standards" shall mean all legislation and regulations of the State of Delaware, or any governmental agencies thereof, pertaining to water quality which are in effect at the time the Supplies are delivered to Artesian. Chester's obligation under this Section 2.11 to give notice to Artesian in respect of matters involving the Delaware Standards shall apply only if, and to the extent that Artesian previously provided Chester with copies of such standards.

2.12 Artesian Deliveries To Chester. Upon Chester's request to satisfy emergency conditions, Artesian shall make available for sale to Chester through the Facility up to one million gallons of water per day at Artesian's then current and regular tariff rates, rules and regulations. Artesian's undertaking to supply bulk water to Chester under this Section 2.12 shall in all events be conditioned upon and subject to Artesian's judgment that delivery of such supplies will not impair Artesian's ability to safely meet the requirements of its jurisdictional customers in the State of Delaware. The provisions of Sections 2.5 and 2.7 hereof also shall apply to Artesian's supply obligation under this Section 2.12.

2.13 Rate Changes. During the term hereof, Chester shall provide Artesian with prior written notice of any plan, filing or proceeding to consider changes in Chester's then current tariff rates, rate structure and/or rules, regulations or other standards for service.

2.14 Term. The parties' obligations under this Article II shall commence as provided at Section 2.2 above and shall continue through December 31, 2002, except as otherwise provided at Section 2.5. At Artesian's sole option and request, Chester shall take such actions as may reasonably be required in support of one or more applications to extend the

term of, and/or seek an increase in the volumetric limitations prescribed by the Supply Permits (but in no event to exceed 6 MGD on an annual average). If the Supply Permits are extended for a further period beyond December 31, 2002, then Artesian shall have the option of renewing the parties' agreements under this Article II for successive one-year Renewal Terms during such further period. Unless the parties otherwise agree, the annual supply and purchase obligation for each such additional Renewal Term shall be 1,460 MG, or such lesser amount as may be allowed under the Supply Permits, as extended.*

ARTICLE III **Miscellaneous**

3.1 Condition Subsequent. The parties' respective rights and obligations hereunder are conditioned upon and subject to the receipt by Chester of: (a) all necessary rights-of-way, easements, fee interests or other real estate for the construction and operation of the Facility; (b) all necessary, final and unappealable zoning, subdivision and land development approvals; and (c) any and all permits and licenses required by federal, state and local governments or agencies thereof to permit the construction and operation of the Facility. Chester shall use its best efforts to apply for and obtain all necessary rights-of-way, easements and fee interests, and all required approvals, permits and licenses

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*Artesian's right to extend the parties' agreement for successive one year Renewal Terms beyond December 31, 2002 shall be subject to Chester's right to terminate this Agreement at the end of each Renewal Term beyond December 31, 2002 by giving to Artesian written notice of its intent to terminate.

at the earliest time practicable under the circumstances. If the Facility cannot be completed or operated due to Chester's inability to secure any of the items described in this Section 3.1, Chester shall refund to Artesian those payments, if any, previously made by Artesian under Section 1.11 hereof.

3.2 Successors And Assigns. This Agreement shall be binding upon and shall inure to the benefit of the parties' respective successors and permitted assigns.

3.3 Authority And Binding Effect. Chester and Artesian each represent, warrant and affirm to the other: (a) their authority and power to enter into this Agreement and to make, perform and carry into effect their respective commitments, obligations and undertakings as set forth herein; (b) their authority to enter into and perform each of the transactions contemplated hereby; (c) that all consents and authorizations requisite to their execution of this Agreement and performance hereunder have been obtained; (d) that this Agreement, the transactions contemplated hereby and the parties' performance hereunder will not violate any federal, state or local law, statute, regulation, rule, ordinance, tariff term or other similar authority applicable to either of them; and (e) when executed, the Agreement shall

constitute a valid and binding obligation, enforceable by each party against the other in accordance with its terms.

3.4 Consent To Assignment. The parties' respective rights and obligations hereunder shall not be assignable or delegable without the prior written consent of the other.

3.5 Amendment. This Agreement may be amended only by written instrument, signed by the party to be bound.

3.6 Entire Agreement. This Agreement embodies the entire agreement between the parties with reference to the subject matter hereof, and there are no agreements, understandings, conditions, warranties or representations, oral or written, expressed or implied, with reference to the subject matter hereof that are not merged in this Agreement or superseded hereby.

3.7 Terms Severable. Should any term of this Agreement be held invalid or unenforceable, such determination shall not render the remaining terms of this Agreement invalid or unenforceable unless to do so would cause the Agreement to fail of an essential purpose.

3.8 Notices. Any notices required or permitted to be given hereunder shall be in writing, shall be effective upon

receipt (unless otherwise provided herein), and shall be delivered by facsimile transmission or by United States mail, first-class postage prepaid, addressed to the parties as follows:

If to Artesian:

President
Artesian Water Company, Inc.
P.O. Box 15004
Wilmington, DE 19850
FAX (302) 453-6958

If to Chester:

Executive Manager
Chester Water Authority
P.O. Box 467
Fifth and Welsh Streets
Chester, PA 19016
FAX (215) 876-2501

3.9 Titles. The titles appearing herein have been inserted for convenience of reference only and shall not be deemed a part hereof or considered in construing the parties' rights and obligations hereunder.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and delivered, and their respective corporate seals to be hereunto affixed by their duly authorized officers, as of the day and year first written above.

(Seal)

Attest

Doris A. Nazzari
Secretary

CHESTER WATER AUTHORITY

By

[Signature]
Executive Manager and
Chief Engineer

(Seal)

Attest

[Signature]
Secretary

ARTESIAN WATER
COMPANY, INC.

By

[Signature]
Senior Vice President

COMMONWEALTH OF PENNSYLVANIA)

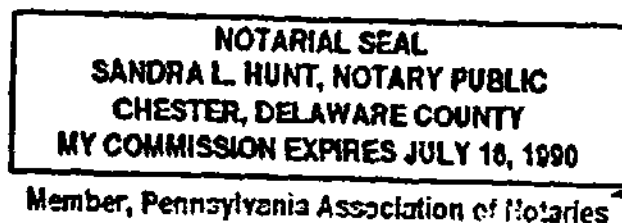
) SS:

DELAWARE COUNTY)

On this, the 6th day of June 1990, A.D.
1990, before me, the undersigned officer, a Notary Public in
and for the State and County aforesaid, personally appeared
Peter K. MacEwen, who acknowledged himself to
be President Manager + Chief Engineer of CHESTER WATER
AUTHORITY, a municipal authority organized and existing under
laws of the Commonwealth of Pennsylvania, and that he, as
such officer, being authorized to do so, executed the
foregoing instrument, for the purposes therein contained, by
signing the name of such municipal authority, by himself as
such officer.

IN WITNESS WHEREOF, I have hereunto set my had and
official seal.

Sandra L. Hunt
Notary Public



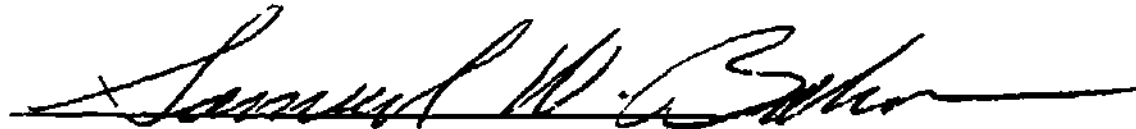
STATE OF DELAWARE)

NEW CASTLE COUNTY)

ss:

On this, the 6TH day of JUNE 1990, A.D. 1990, before me, a Notary Public in and for the State and County aforesaid, personally appeared PETER N. JOHNSON, who acknowledged himself to be SENIOR VICE PRESIDENT of ARTESIAN WATER COMPANY, INC., a corporation organized and existing under laws of the State of Delaware, and that he, as such officer, being authorized to do so, executed the foregoing instrument, for the purposes therein contained, by signing the name of such corporation, by himself as such officer.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.



Notary Public

Exhibit 10

AGREEMENT

THIS AGREEMENT ("Agreement"), dated as of the 22nd day of December, 1986, by and between the City of Wilmington, a municipal corporation of the State of Delaware, acting by and through the Department of Public Works ("City"), and Artesian Water Company, Inc., a Delaware corporation having its principal offices at 666 Churchmans Road, Newark, Delaware ("Artesian").

WHEREAS, Artesian desires to have an additional supply of water for its customers in New Castle County through an interconnection with pump and meter vault to be located at Maryland Avenue near Jefferson Street ("Interconnection"); and

WHEREAS, City has adequate supplies of water to furnish up to 3,500 gallons per minute or five million gallons per day to Artesian through the interconnection, absent emergency situations, under and in accordance with the terms hereof.

NOW, THEREFORE, in consideration of the mutual promises set forth herein, the parties hereto, intending to be legally bound hereby, agree as follows:

1. Artesian shall prepare engineering plans and specifications (construction plans) for the design, construction and operation of the interconnection, which construction plans will be subject to the written approval of City, which approval shall not be unreasonably withheld.

2. After Artesian has received written approval of the construction plans from City, Artesian shall let contracts for

and shall construct said interconnection and any required related facilities including the required pumps, meter and meter pit, and shall inspect same as necessary. Artesian shall pay all third party construction costs, including but not limited to related engineering and inspection costs. If City seeks to make changes in the construction plans after it has expressed written approval, City shall be responsible for all additional costs of preparing engineering plans and specifications and for any increase in cost over that included in the contracts let by Artesian for the construction of the interconnection and related facilities due to the changes or modifications proposed by City. Artesian shall own, operate and maintain the interconnection meter pit and the required related facilities therein. Artesian shall not be responsible for or pay any costs, disbursements, expenses or related fees of agents or employees of City who participate in or are engaged in the project.

3. City shall permit Artesian to wet tap and make a 20" connection to City's existing 20-inch main at Jefferson Street, the location of which is described in Exhibit "A" hereto. City will close required valves and any appropriate portion of the system during construction, when and if necessary.

4. After completion of construction of the interconnection, Artesian shall be responsible for all maintenance, repair and operation of the piping and accessories external to the meter pit on its side (westerly), and including appurtenances in the pump and meter pit, excluding the water meter, while City shall be responsible for all maintenance,

repair and operation of the piping and accessories external to the meter pit on its side (easterly) and the water meter in the meter pit, all as more fully illustrated and described in Exhibit "A" hereto.

5. Artesian agrees to pay in full and at no cost to the City the cost of construction of the 20" water main between City's 20" water main on Jefferson Street and Artesian's 16" water main on Maryland Avenue, interconnection vault with pumps, meter and other appurtenances including the expense of wet-tapping the City's 20" main.

6. Artesian also agrees to pay in full and at no cost to City the actual cost of Phase 1 improvements: (a) construction of a new 8" main in Jefferson Street between Fourth and Eighth Streets (estimated cost: \$55,000); (b) construction of a new 8" main in Cedar Street (estimated cost: \$14,000) and (c) construction of new interconnections to allow conversion of low service zone at Maryland Avenue and Franklin Street to high service (estimated cost: \$20,000). Exhibit "1".

7. Artesian and City agree to pay equally (50/50 basis) the actual cost towards Phase 2 improvements to City's pump #6, which is estimated to cost \$540,000. In case the cost of Phase 2 improvements exceeds the estimated price by more than 15%, then Artesian shall have the right to review and agree on such additional cost.

8. Artesian hereby agrees to indemnify and hold City harmless from any and all liability for damages or injuries (including death) to any person or property whatsoever, arising

from or occasioned by the construction, maintenance or operation of said interconnection and related facilities, whether or not such liability is based upon City's alleged active or passive negligence or participation in the wrong or upon any alleged breach of any statutory duty or obligation on the part of City. Artesian, however, shall not be responsible under this paragraph for any liability arising from or occasioned by acts of City employees, agents or representatives that constitute gross negligence or willful misconduct.

9. After completing Phase 1 improvements to City's water system, City shall furnish a maximum of three million gallons of water per day (defined as a 24-hour period commencing at 6 a.m.) to Artesian through the interconnection on a sustained or on an as-needed basis. City shall not require that Artesian give notice of normal usage inasmuch as interconnection is to be used on a regular basis. However, whenever practical, Artesian shall notify City 24 hours in advance of activating and deactivating the interconnection whenever Artesian interrupts normal usage. During emergencies, either party notifies each other without any time limit.

MAX. RATE
Ph 1

10. After completion of Phase 2 improvements to City's pumping equipment, City shall furnish a maximum of three million gallons per day on a sustained basis and an additional two million gallons per day on an interruptable basis.

MAX. RATE
Ph 2

11. In the event of an emergency situation, as determined by City, City shall have the right to restrict, partially or fully, the quantity of water that shall be delivered

to Artesian through the interconnection. In the event of an emergency, City shall notify Artesian of such full or partial restriction as soon as may be practicable.

12. Artesian agrees to purchase a minimum of 200 million gallons of water per year (defined as a 12-month period commencing on the date water first becomes available or anniversary thereof) at the rate specified herein. In the event that Artesian does not actually utilize the stated minimum, the rate for 200 million gallons per year shall be paid to City at the end of said one year period notwithstanding the amount of water actually used. In the event that City is unable to furnish 200 million gallons of water to Artesian in any one year period due to emergency situations, then Artesian shall be billed only for water actually furnished. Except in the event of an emergency situation, the interconnection shall be available for normal usage by Artesian 365 days per year. In the event of emergency conditions and the interconnection is not available for usage by Artesian at least 200 days in any one year period, then Artesian shall be billed only for the quantities of water actually furnished.

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13. Artesian agrees to pay for water purchases on a monthly basis utilizing that rate per thousand gallons of water supplied which is equal to 70% of the industrial in-city customer usage rate, (at the present time 70% of the Industrial In-City Customer rate is \$.70/1,000 gallons), which is subject to adjustment from time to time whenever City amends its water usage charges for industrial in-city customers. If City has more than

RATE

one industrial in-city tariff, Artesian's bill will be computed based on the industrial in-city tariff rate most advantageous to Artesian.

14. The quality of water delivered through the interconnection will at all times meet the standards specified by the Delaware State Board of Health, provided, however, that if the water delivered through the interconnection for any reason does not meet the standards specified by the Delaware State Board of Health, Artesian shall have the right to terminate this entire Agreement.

15. Artesian agrees that it will make no claim against the City for damages as a result of pressure of water furnished hereunder in the event that due to acts of God, conditions beyond City's reasonable control, or the result of making necessary repairs, alterations or additions, or as a result of repairs, alterations or additions, is unable to regulate the flow of water through the interconnection.

16. The provisions of this Agreement shall remain in full force and effect for a term of 10 years from the date hereof and shall be extended thereafter automatically for additional terms of 5 years, unless a party hereto gives written notice of termination to the other party at least 6 months prior to the end of the initial term or of any renewal term.

17. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of the parties hereto and shall be enforceable in the appropriate forum in the State of Delaware. Neither party shall assign this Agreement without the

WATER

prior written consent of the other; provided, however, that if the business of Artesian is taken over by a successor company, it shall not be deemed an assignment under this paragraph. This Agreement shall terminate in the event of any attempted assignment without such prior written consent. The parties may, through their duly authorized and acting representatives, by an instrument in writing, amend this Agreement from time to time as may be appropriate or necessary.

18. This Agreement is subject to and contingent upon the receipt of any and all necessary approvals and permits required by the Delaware River Basin Commission, the Delaware Department of Natural Resources and Environmental Control, the Delaware Public Service Commission ("PSC"), and any other regulatory body having jurisdiction over the matters described herein. Artesian shall seek the approvals and permits required by the PSC and the Delaware Departments of Health and Transportation; City shall seek those required by all other regulatory bodies. Artesian shall bear all of the costs and expenses, including attorneys' fees and consultants' charges, of seeking the approvals and permits required by the PSC, Department of Health and Department of Transportation. City shall bear the routine costs and expenses, including routine attorneys' fees and consultants' charges, of seeking the approvals and permits required by all other regulatory bodies.

19. A. This Agreement shall terminate if any statute, regulation, judicial or administrative proceeding, or any other action by any governmental entity ever:

1. Results in any increased cost or expense to City in the performance of this Agreement unless the parties enter a written supplemental agreement in which Artesian agrees to pay in full for all such increased costs and expenses; or

2. Renders performance of this Agreement impossible.

B. If City, in its sole, but reasonable discretion, determines that because of this Agreement, any statute, regulation, judicial or administrative proceeding, or any other action by any governmental entity results in an adverse effect on City's water supply, City may terminate this Agreement by sending Artesian a written notice to that effect.

C. If this Agreement ever becomes an issue in any judicial or administrative proceedings that City, in its sole discretion, determines may result in any adverse effect on City's water supply, Artesian shall pay a proportion of all costs and expenses incurred by City related to that proceeding, including a proportion of all attorneys' fees and consultants' charges. If the parties cannot agree on Artesian's proportion of such costs and expenses, this matter shall be determined by binding arbitration in accordance with either the commercial arbitration rules of the American Arbitration Association then in effect, or any other mutually agreeable arbitration procedure. This Agreement shall terminate if Artesian fails to pay its proportion of the costs and expenses so determined. Judgment upon the arbitration award for Artesian's proportion of the costs and expenses incurred by City may be entered in any court with proper

jurisdiction. The parties shall each pay one-half of all reasonable fees and expenses associated with the arbitration proceeding, but each party shall be responsible for the costs of its own presentation at the arbitration hearing.

20. If this Agreement ever terminates for any reason whatsoever, Artesian shall pay City all amounts due under this Agreement pro rated to that time.

IN WITNESS WHEREOF, City has caused these presents to be signed in its corporate name by the Mayor, and its corporate seal, duly attested by the City Clerk to be hereunto affixed; and Artesian has caused these presents to be signed in its corporate name by its Vice President, and its corporate seal, duly attested by its Secretary, to be hereunto affixed, as of the day and year first written above.

THE CITY OF WILMINGTON

By: David H. Mawley
Mayor

Approved as to form:

Date: 12/17/86
Mark P. Phil
Assistant City Solicitor

Attest:

Le P. H. Marshall
City Clerk

ARTESIAN WATER COMPANY, INC.

By: Peter H. Johnson
Vice President

Attest:

Louise J. Thurlon
Secretary

Exhibit 11

Exhibit 11

ARTESIAN WATER COMPANY, INC. Standpipes and Elevated Tanks

LOCATION	TYPE	BASE ELEVATION	OVERFLOW ELEVATION	ALTITUDE VALVE	DIMENSIONS-FT		CAPACITY TOTAL	GALLONS ACTIVE (1)	RESERVE (2)	SUM EFFECTIVE CAPACITY (3)
					DIA.	HGT.				
Service Level 1										
BEAR TANK	STNDP	83.65	186	YES	93	106.5	5,396,000	1,920,000	605,000	
CLEARVIEW	ELEV	68	186.17	YES	56	35	600,000	600,000	0	
GLASGOW	ELEV	60.6	186	YES	74	40	1,000,000	1,000,000	0	
RED LION	ELEV	82.5	186	YES	100	40	2,000,000	2,000,000	0	
SCHOOL LANE	RES	69	119.75	YES	82	50.7	2,000,000	1,750,000	0	7,875,000
Service Level 2										
COOPER FARM #1	RES	180.36	248.36	YES	90	68	3,000,000	920,000	508,000	
COOPER FARM #2	STNDP	180.36	248.36	YES	42	68	660,000	202,000	112,000	
CROW HILL TANK	RES	205	245	YES	130	40	3,972,000	1,737,000	1,142,000	
TUXEDO PARK #1	RES	47	82	NO	70	35	1,000,000	900,000	0	
TUXEDO PARK #2	RES	47	71	NO	60	24	500,000	450,000	0	
TYBROOK #1	RES	192.36	248.36	NO	96	56	3,000,000	1,117,000	616,000	
TYBROOK #2	RES	192.36	248.36	NO	60	56	1,184,000	441,000	243,000	
TYBROOK #3	STNDP	192.36	248.36	NO	20	56	110,000	41,000	22,000	
WILLOW RUN	ELEV	116	246	YES	74	40	1,000,000	1,000,000	0	9,451,000
Service Level 3										
PIKE CREEK	RES	335	395	YES	106	60	4,000,000	2,500,00	766,000	
SHERWOOD PARK II	ELEV	183	318	YES	34	29.5	150,000	150,000	0	3,416,000
Service Level 4										
NORTH STAR	ELEV	339.5	457.75	YES	36	28	200,000	200,000	0	
OLD WILM. ROAD	RES	405	461	YES	60	56	1,187,000	710,000	243,000	
STENNING WOODS	RES	389	460	YES	98	71	4,000,000	4,000,000	0	5,153,000
Service Level 5										
OLD WILM. ROAD	ELEV	405	563	NO	29.5	29.5	150,000	150,000	0	150,000
TOTALS							35,109,000	19,288,000	4,257,000	26,045,000

Notes:

- (1) Active Capacity Storage will provide a minimum 25 psi to the highest ground elevation it services.
- (2) Reserve Capacity is additional storage available between 25 and 20 psi for emergency use.
- (3) The sum of active and reserve capacities.

ELEV = Elevated
HORIZ=Horizontal
RES = Reservoir
STNDP = Standpipe

Exhibit 12

Exhibit 12

SUMMARY OF HISTORIC SYSTEM DELIVERY
Northern New Castle County

YEAR	# Customers	Annual Delivery			Total MG	Maximum Month Delivery		
		Total MG	Average MGD	Percent Increase		Total MG	Average MGD	MaxMo/Avg Ratio
1981	36,449	4140	11.34		311.19	399.51	12.89	1.11
1982	36,846	4236	11.61	2.3%	314.97	421.02	13.58	1.14
1983	37,596	4333	11.87	2.3%	315.76	392.77	12.67	1.06
1984	38,533	4379	11.96	0.8%	310.50	403.90	13.03	1.05
1985	39,768	4537	12.43	3.9%	312.57	485.79	16.19	1.20
1986	41,120	4928	13.50	8.6%	328.34	482.34	15.56	1.13
1987	43,246	5041	13.81	2.3%	319.36	537.26	17.91	1.21
1988	45,532	5422	14.81	7.3%	325.36	507.54	16.92	1.10
1989	47,735	5602	15.35	3.6%	321.52	533.82	17.22	1.11
1990	49,568	5641	15.45	0.7%	311.79	614.58	20.49	1.24
1991	50,865	6043	16.56	7.1%	325.49	606.95	19.58	1.15
1992	52,014	6208	16.96	2.4%	326.08	647.19	20.88	1.19
1993	53,599	6409	17.56	3.5%	327.60	676.12	21.81	1.22
1994	55,096	6506	17.82	1.5%	323.52	654.76	21.83	1.21
1995	56,663	6560	17.97	0.8%	317.18	562.08	18.13	1.03
1996	57,879	6402	17.54	-2.4%	303.04	707.37	22.82	1.26
1997	59,112	6626	18.15	3.5%	307.10	672.20	21.68	1.18
1998	60,045	6705	18.37	1.2%	305.93	709.55	22.89	1.25
1999	61,502	6657	18.24	-0.7%	296.55	615.06	19.84	1.09
2000	62,550	6637	18.13	-0.6%	289.91	672.42	21.69	1.17
2001	63,298	6853	18.78	3.5%	296.62	625.16	20.17	1.11
2002	64,268	6776	18.56	-1.1%	288.85	598.06	19.29	1.08
2003	65,025	6658	18.24	-2.0%	272.63	637.59	20.57	1.11
2004	65,556	6523	17.87	4.0%	280.51			
2005	66,272	6785	18.59					

Exhibit 13

**Exhibit 13-
Customer Delivery-
Northern New Castle County**

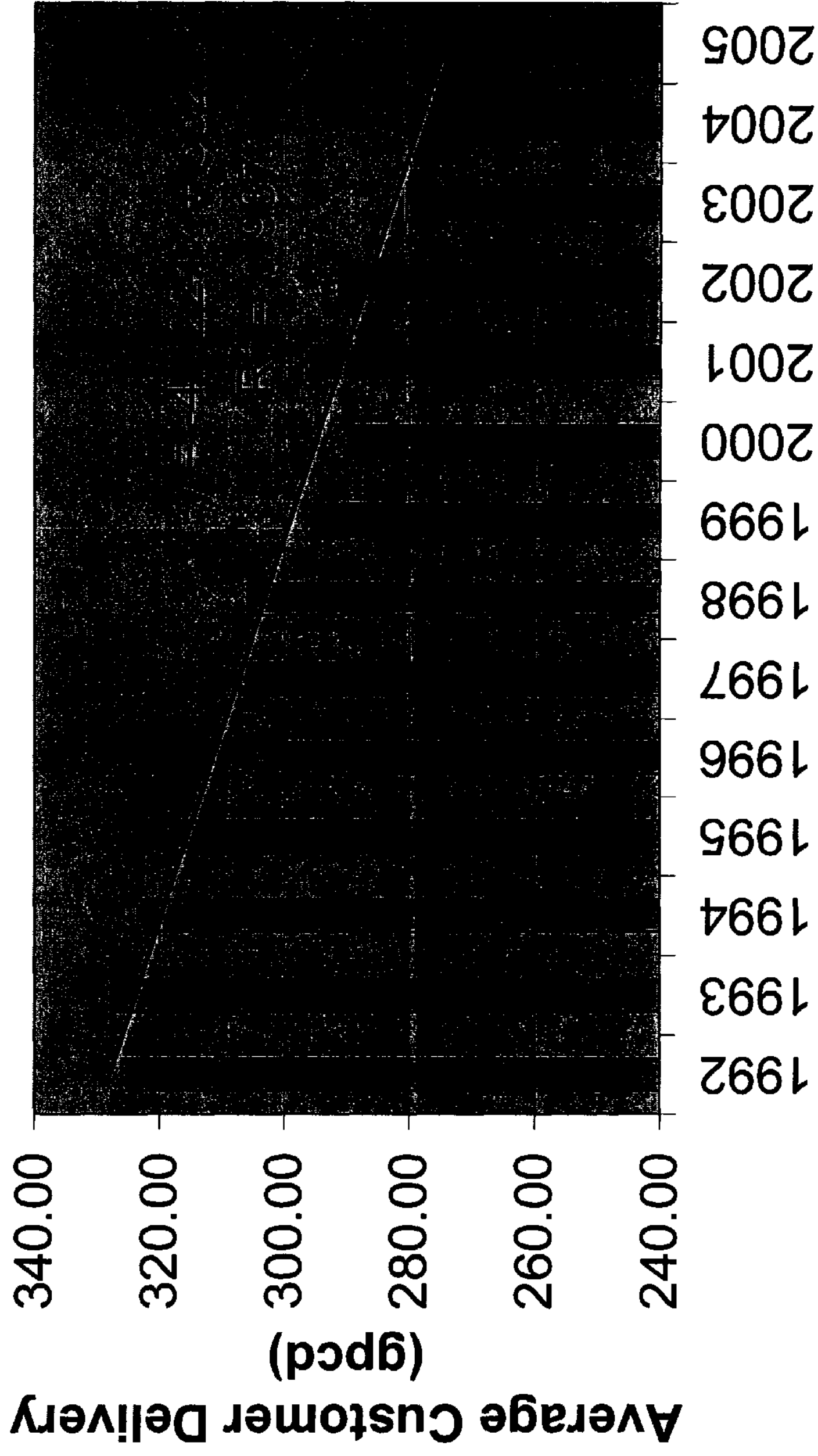


Exhibit 14

Exhibit 14

Summary of Supply and Projected Demand

Source of Supply

Self-Supply	24.86 MGD
ASR	1.60 MGD
Interconnections	3.70 MGD
Total Available Supply	30.16 MGD

WSCC Projected Peak Demand

	23.30 MGD
Margin	6.86 MGD